

Terry J. McGenity · Kenneth N. Timmis · Balbina Nogales
Editors

Hydrocarbon and Lipid Microbiology Protocols

Petroleum, Hydrocarbon and Lipid Analysis

Scientific Advisory Board

Jack Gilbert, Ian Head, Mandy Joye, Victor de Lorenzo,
Jan Roelof van der Meer, Colin Murrell, Josh Neufeld,
Roger Prince, Juan Luis Ramos, Wilfred Röling,
Heinz Wilkes, Michail Yakimov

Contents

Introduction to Petroleum, Hydrocarbon, and Lipid Analysis	1
Heinz Wilkes	
Volume 2: Hydrocarbon Extraction	9
Daniel J. Letinski and Roger C. Prince	
Determination of Petroleum Hydrocarbon Compounds from Soils and Sediments Using Ultrasonic Extraction	31
Frédéric Coulon and Guozhong Wu	
Protocols for the Chemical Analysis of Hydrocarbons in Petroleum Oils and the Assessment of Environmental Contamination	47
James W. Readman, Josep M. Bayona, and Joan Albaigés	
Analysis of Lipids and Polycyclic Aromatic Hydrocarbons as Indicators of Past and Present (Micro)Biological Activity	61
Guido L.B. Wiesenbergs and Martina I. Gocke	
Protocols for GC-Based Methods for Generic and Environmental Hydrocarbon Analysis	93
Clifford C. Walters	
Comprehensive Two-Dimensional Gas Chromatography to Assess Petroleum Product Weathering	129
Robert F. Swarthout, Jonas Gros, J. Samuel Arey, Robert K. Nelson, David L. Valentine, and Christopher M. Reddy	
Measuring Hydrocarbons in the Atmosphere	151
Ian Colbeck	
Protocols for the Quantification of Dimethyl Sulfide (DMS) and Other Volatile Organic Compounds in Aquatic Environments	161
Filippo Franchini and Michael Steinke	
Fluorescence EEMs and PARAFAC Techniques in the Analysis of Petroleum Components in the Water Column	179
Zhengzhen Zhou, Laodong Guo, and Christopher L. Osburn	
Protocols for Measurement of Naphthenic Acids in Aqueous Samples	201
Lisa Brown and Ania Ulrich	

Compositional Characterization of Acidic Petroleum Constituents Using Negative Ion Mode Electrospray Ionization Coupled with Fourier Transform-Ion Cyclotron Resonance Mass Spectrometry	217
Stefanie Poetz and Heinz Wilkes	
Measurement of Hydrocarbon Bioavailability in Soil	231
Gabriela M. Vázquez-Cuevas and Kirk T. Semple	
Measurements of Hydrocarbon Pollutants in Aqueous Samples Using Bacterial Bioreporter Assays	247
Yoann Digabel, Siham Beggah, and Jan Roelof van der Meer	
Protocol to Investigate Volatile Aromatic Hydrocarbon Degradation with Purge and Trap Coupled to a Gas Chromatograph/Isotope Ratio Mass Spectrometer	259
Armin H. Meyer, Michael P. Maier, and Martin Elsner	
Comprehensive Analysis of Microbial Lipids in Environmental Samples Through HPLC-MS Protocols	289
Lars Wörmer, Julius S. Lipp, and Kai-Uwe Hinrichs	